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ABSTRACT

This summary pamphlet was prepared from tape recordings of sessions at the second Forum on Federal Information Policies, which opened with an introduction and program overview by Carol A. Nemeyer, and a keynote address by Congressman Mervyn M. Dymally. The first panel session, International Influences on Federal Information Policies, with Jane Bornick presiding, included: "Department of Defense (DOD) Publication Policy" (Leo Young); "National Security Controls on Scientific Communication" (Richard A. Meserve); "Government Controls and Their Effects on Scientific Society Meetings and Publications" (Rosemary Chalk); "The Legal Aspects of Information as an International Commodity" (John Farmakides); and "The Ferment in International Telecommunications" (Henry Geller). The pamphlet provides brief summaries for each paper. The second panel session, International Influences on Flow of Scientific and Technical Information (STI), with Joseph G. Coyne presiding included: "Difficulties in International Cooperation on STI with Government Related Organizations" (James V. Seals); "Acquisition and Use of Foreign Technical Information" (Joseph E. Clark); "International Scientific and Technical Publishing: A Private Sector Perspective" (Charles B. Stoll); and "Current Issues That Have Arisen Affecting the International Flow of Information" (Lewis I. Flacks). (THC)

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Federal Library and Information Center Committee

FEDERAL INFORMATION POLICIES

IR 051 432

This summary was prepared from tape recordings of the second FLICC Forum on Federal Information Policies. Tapes of the entire conference have been added to the Library of Congress collections and are available in the Recorded Sound Reference Center, Performing Arts Reading Room, James Madison Memorial Building (ask for tape RWA 8596-98).

Federal Library and Information Center Committee

SECOND FORUM
FEDERAL INFORMATION POLICIES

The International Flow of Scientific and Technical Information

A SUMMARY OF PROCEEDINGS
Prepared by
Barbara J. Meredith

Library of Congress
Washington 1985

PROGRAM

Welcome, Introduction, and Program Overview
Dr. Carol A. Nemeyer, *Associate Librarian for National Programs, Library of Congress*

Keynote Statement
Congressman Mervyn M. Dymally, *(D-Calif.), U.S. House of Representatives*

INTERNATIONAL INFLUENCES ON FEDERAL INFORMATION POLICIES

Presiding: Jane Bortnick, *Congressional Research Service, Library of Congress*

"DOD Publication Policy"—Dr. Leo Young, *Director for Research and Laboratory Management, Department of Defense*

"National Security Controls on Scientific Communication"—Richard A. Meserve, *Partner, Covington and Burling*

"Government Controls and Their Effects on Scientific Society Meetings and Publications"—Rosemary Chalk, *Program Head, Committee on Scientific Freedom and Responsibility, American Association for the Advancement of Science*

"The Legal Aspects of Information as an International Commodity"—John Farmakides, *Partner, Whitney & Dempsey*

"The Ferment in International Telecommunications"—Henry Geller, *Director, Washington Center for Public Policy Research*

INTERNATIONAL INFLUENCES ON FLOW OF SCI/TECH INFORMATION

Presiding: Joseph G. Coyne, *Manager, Office of Scientific and Technical Information, U.S. Department of Energy*

"Difficulties in International Cooperation on STI with Government Related Organizations"—James V. Seals, *Director, STN International and International Programs, Chemical Abstracts Service*

"Acquisition and Use of Foreign Technical Information"—Dr. Joseph E. Clark, *Deputy Director, National Technical Information Service*

"International Scientific and Technical Publishing: A Private Sector Perspective"—Charles B. Stoll, *Vice President, John Wiley & Sons, Inc.*

"Current Issues that Have Arisen Affecting the International Flow of Information"—Lewis I. Flacks, *Policy Planning Advisor to the Register of Copyrights, Copyright Office, Library of Congress*

On February 27, 1985, the Federal Library and Information Center Committee (FLICC) convened its second annual Forum on Federal Information Policies at the Library of Congress. "The International Flow of Scientific and Technical Information" brought together some one hundred public and private sector librarians and information policy leaders to hear distinguished professionals discuss a subject of great and growing importance to the future of world communications.

Dr. Carol A. Nemeyer, Associate Librarian for National Programs, welcomed participants and thanked key members of the FLICC Executive Advisory Committee for their help in planning the program. (Later, Nemeyer was herself credited for her "vision in pioneering and conceptualizing this forum.") "As I look around this roomful of leaders," she said, "I am proud to be a member of this dynamic profession." Nemeyer introduced Jane Bortnick, Specialist in Information Science and Technology in the Congressional Research Service, Library of Congress, who moderated the morning session.

The Keynoter

Bortnick's introduction of California Congressman Mervyn M. Dymally noted his memberships on the House Foreign Affairs and Science and Technology Committees, and his chairmanship of the Science and Technology Caucus—positions which uniquely qualified him to launch the forum. "To understand what drives federal information policy," Dymally said, "you must understand the combination of pressures on lawmakers. Information is part of a generic list of materials whose international flow the military urges U.S. policymakers to control. The materials are products, components, techniques, and processes, and the findings of basic research."

The military says this list applies to both militarily and commercially sensitive materials. Dymally argued that control of access to *products* should not be a blueprint for control of access to *information*. What applies to military products may not apply to competitively sensitive materials.

Dymally noted military officials' contention that the Russians, who were ten to twelve years behind us in the 1960s, are now only three to five years behind, having narrowed the gap by taking

our technology. They can acquire our latest microelectronic components within about ten months after we make them. With ready access to our basic research (information), they may develop advanced hardware (components, processes, products) before we do. Dymally explained that the military applies this "blanket principle" to the commercial arena as well. State-of-the-art commercial products, the military says, are not different from state-of-the-art military products. A supercomputer can handle military data as fast as it can handle business and scientific data. If holography can help in the supermarket by identifying bar codes on irregular surfaces, maybe it will also help spot soldiers on rough terrain. Hardware that keeps a precise fix on commercial aircraft may help the Russians pinpoint military flights. Advances in sound isolation and vibration for commercial machinery could make quieter submarines.

Military pressure makes policymakers less discriminating, Dymally said. "I think distinctions should be made among products, components, techniques, information . . . and basic scientific discoveries; and maintained between what is militarily and what is commercially significant."

The international flow of information is also affected by our parochial view of the free enterprise system, Dymally added. Lawmakers are beginning to rethink the burdensome antitrust and patent laws. These reflect a national philosophy that competition, not cooperation, makes the business world go round. Written in another era to prevent monopolies, the laws discourage corporations from joint manufacture of products and encourage the guarding of information about both techniques and basic scientific discoveries. Bell Laboratories' internal publication system, Dymally noted, gives scientists within the company the prestige and peer recognition rewards that would otherwise be satisfied by publication in scientific journals. In our business environment, growth is still a necessary ingredient of prosperity, but it takes place in the world, not simply in the United States.

Government control is institutionalized in U.S. world corporate expansion and in some countries with which we compete. Some of our companies, barred from joint domestic ventures, are teaming up with foreign competitors to get the

edge on U.S. rivals. In the oil industry, for example, many products combine American and Japanese components.

While the military recommends imposing greater control on the international flow of scientific and technical information (STI), signals from the business sector are mixed, Dymally continued. Many industries want strict control of international technology transfer. Automakers want increased control of imports but no controls on their international joint ventures; so too steelmakers and textile manufacturers. The more innovative electronics companies are experimenting with joint ventures domestically, recognizing that the rules need to be changed fundamentally to facilitate international competitiveness.

Arrogance about the English language exerts an influence on policymakers in the international flow of STI. When linguistic arrogance had a foundation in fact, it served us, Dymally observed. We *did* do the best research. We *were* ingenious. Our products *did* set the world's standards, and everyone copied us. They wanted what we had and dutifully learned English to get it.

Times have changed, the Congressman said. The President's Science Adviser tells us that we have permanently lost our lead and should abandon federal support in some areas of technology to keep the edge in militarily important areas. Our interest is no longer just in the outflow but in how to increase the inflow of international STI, information we are not producing domestically.

"Our arrogance has caught up with us," he said. "Most of our scientists and technicians do not know Japanese, cannot speak Russian, don't understand Swedish, don't want to learn German, can't even speak French." Librarians and translators are the collectors of international information, not nuclear physicists, chemists, or microelectronics engineers. Deliberate efforts at the federal level to curtail library resources have resulted in less money for collecting, disseminating, and translating information. Moreover, to stem the outflow our government has made it difficult for American scientists and information specialists to contact their foreign counterparts through international meetings and joint research.

How should policymakers act in this atmo-

sphere? First, Dymally said, we must grasp the scope of the problem, which includes everything from finished military and business products to fundamental scientific discoveries that may someday result in product innovation. Second, we must resist the strong pressure to judge everything within this scope as amenable to the same kinds of control. Lack of communication among scientists stunts discovery. "The medicine we use to control free exchange may save the data but kill the science."

In information, the United States is clearly behind some countries in some disciplines. A reluctance to share may thus be self-defeating, since it is often we who want the information that others have. The same applies to techniques and processes. We would like to be as good, say, at robotics or computer-aided design as the Japanese. We should stop believing that we can get what we want without sharing anything in return.

Third, Dymally continued, policymakers need to listen as carefully to the views of scientists and librarians as they do to those of the Pentagon and captains of industry. Unfortunately, he said, we have not heard enough from these sectors. Scientists panic at the threat of censorship. They police themselves to avoid outside intervention. Schools require proof of citizenship for attendance at certain conferences. Researchers hesitate to read papers at scientific gatherings for fear of contradicting the obliquely stated wishes of intelligence agency officials. Such fears have an unhealthy, chilling effect. Fourth, we must reform our patent and antitrust laws to stimulate rather than impede international competitiveness, and finally, we must embark on a national program to change our own attitudes. Our isolationist stance is outmoded. This nation must realize that the effort to fashion an American shared information policy will make us better able to play a role on the world stage.

"Don't be isolationists yourselves," Dymally urged the audience, "deal with how you are going to make the most influential and enlightened impact in the national policy debate on the international flow of strategic and competitive resources."

International Influences on Federal Information Policies

"A global telecommunications network has emerged today," Jane Bortnick noted in introducing the first panel session. High-speed computing, increased memory capacity, miniaturization, satellites, and fiber optics contribute to the ability of all nations to gather, store, and disseminate information. Governments and international organizations, she said, are taking diverse actions to control access to STI.

Department of Defense (DOD) Publication Policy

Dr. Leo Young, Director of Research and Laboratory Management at DOD, said he sometimes feels almost "schizophrenic" about two of his many responsibilities. On the one hand he must get information out to U.S. industry and on the other, he must try to hold information back from "the wrong people who might use it against us."

Using slides of a U.S. and a Russian aircraft, Young dramatically illustrated how the Russians benefit from our information. The audience saw a 1976 U.S. military airplane which was never mass produced. The Russian plane, which looked like an exact duplicate, flew one year later. The Russians did not have to copy the plane itself; they found the drawings in our published literature. To prevent the Soviet Union and its allies from benefiting from data we publish, a 1976 DOD report recommended that we "watch the technology and watch the know-how." As a result, the department began to exercise greater control of information and data, eventually expanding this control to include some university research if it was in militarily critical areas.

Two statutory controls exist on the export of technology. The Export Administration Regulations (EAR) control the export of dual-use technology, such as computers, that have both civilian and military applications. The International Traffic in Arms Regulations (ITAR) apply to munitions and articles of war. A breach of these regulations is a criminal offense. The information DOD generates, sponsors, or contracts out may be considered proprietary, rather like a private company's; "DOD, therefore, has the right to control it,"

Young said. Only civil action can be taken against violators of contractual agreements concerning such information. Information the government generates is sometimes sensitive and that information should be held back, he said. How should we control information sensibly and yet make quick decisions about what should be published?

A 1982 report entitled *Scientific Communication and National Security*, published by a National Academy of Sciences panel, suggested that technical information should be held back if (1) it can be used by our enemies, (2) it is moving so fast that it may soon become a product, or (3) the United States is the only source of that information. These recommendations were difficult both to apply and to implement, according to Young.

In 1984, DOD established three new criteria for its own information: (1) Who is the performer? (2) What is the budget category? (3) Who sponsors the work? A draft national DOD policy says that when work sponsored by DOD is *fundamental* research, no attempt should be made to control it; it can be published freely. DOD defines fundamental research by performer, budget category, and sponsor. Under the Freedom of Information Act (FOIA), the Defense Department must release information which it might consider to be critical military technology, and under EAR anything can be exported if it has already been published—thus creating a "Catch 22" situation. If an individual wanted information that was controlled under export laws, he had only to request it under FOIA. DOD had to release it. It thereby became published and automatically exportable.

For its 1984 congressional appropriations request, DOD drafted two directives that are currently being used. The first (DOD Directive 5230.25) says that material subject to export controls does not have to be released. The second, (DOD Directive 5230.24) provides a system of markings to speed release of documents that DOD or its contractors generate. Documents are marked (1) unclassified, unlimited distribution; (2) DOD only; (3) DOD and its contractors only; (4) the federal government only; (5) the federal government and its contractors only; (6) special cases; or (7) subject to export control — that is, an individual may have access to a document, but cannot export it or give it to someone who may export it.

However, unclassified contract fundamental research can be freely published and is never subject to export controls.

National Security Controls on Scientific Communications

Government efforts to tighten control of scientific communications for reasons of national security result from several trends. Richard Meserve, a partner in the law firm Covington and Burling, noted that in a period of international tension with the Soviet Union, heightened concern for our defense capabilities is understandable. Controls are justified because our defense capability depends on the high technology edge that controls seek to maintain. Moreover, the Soviet acquisition program is aggressive; there is evidence that the Soviet effort is directed from the highest government levels, may involve 100,000 people, and may have saved the Soviets hundreds of millions in research and development (R&D) costs and years of R&D lead time. Scientific communications are of interest because the Soviets have expanded their information-gathering efforts to include U.S. universities and research centers.

Nonetheless, tightening control on scientific communications is counterproductive. The benefits of restrictions are dubious. A National Academy of Sciences' panel concluded, and the intelligence community agreed, that though the Soviets have tried to obtain technical data from university scientists, there is no "specific evidence of damage to U.S. national security caused by information obtained from U.S. academic sources."

There are also persuasive reasons, Meserve said, why controls on scientific communications impose excessive costs: (1) Controls impede scientific progress. Science is an activity in which each scientist builds on the work of others. Openness makes new ideas subject to critical review, keeps the quality of research high, fosters creativity, and offers answers to problems in one field from research in another. (2) Controls have undesirable effects on scientific manpower. Academics must publish or perish. A field closed to publication drives scientists into another. Universities train future generations. Controls may drive both today's and tomorrow's best scientists from the fields that

are of greatest national security importance. (3) Controls are founded on the incorrect assumption that the United States by itself can control scientific advance. We no longer command, Meserve noted, a unique position in the scientific universe. Controls imposed unilaterally do not pose a substantial obstacle to the Soviets because of the availability of information abroad, but they deny American scientists the opportunity for give-and-take exchanges with foreign peers. (4) Scientists are unaccustomed and unwilling to keep secrets. Up to 40 percent of engineering graduate students are foreigners. How can a control system on our campuses ever prove effective?

Legal considerations reinforce these policy concerns, Meserve said. The Supreme Court has stated that the First Amendment protects our right to communicate with both U.S. citizens and foreigners. Before-the-fact restrictions entailed in any control scheme are the least tolerable limitations on First Amendment freedoms.

There are some indications that this view of the importance of openness may become the law, according to Meserve. Congress is now considering a reauthorization of the Export Administration Act that contains helpful language. The executive branch is reviewing a policy that would bar terms in government contracts that restrict the communication of information on nonclassified fundamental research. Moreover, an interagency group under the leadership of the President's Science Adviser is at work on modifications in the Export Administration Regulations that would relax controls on scientific communications.

Nonetheless, there are also some troubling signs. The contract policy has been pending for issuance for nearly eight months. Moreover, continuing governmental efforts to restrict access to scientific conferences show that there are still those who would restrict scientific communications.

Meserve also described how export controls work. Data subject to controls are defined as "information of any kind that could be used or adapted for use in the design, production, manufacture, utilization or reconstruction of articles or materials." The terms "export" and "re-export" are defined not only as direct transmission across national boundaries but as any release of informa-

tion in another country or within the United States with the knowledge or intent that the data will be transmitted abroad. A prohibited release may be a "visual observation" of equipment or facilities, an "oral exchange," or even applying one's experience in a foreign country. Thus, a visit to a U.S. laboratory by a foreign national or even conversing with a foreigner about a technical matter may be deemed an export of technical data. These definitions bring ordinary scientific communications formally within the control system, although the current law provides general licenses (basically exemptions) that alleviate extreme applications of the system. One suggested change in the regulations, however, would require validated licenses for exports of data on critical technologies —such as information on a semiconductor fabrication technique. If these proposals are adopted, an American scientist, Meserve warned, might have to file for approval from the Commerce Department before talking about a critical technology with even a Western European colleague.

Government Controls and Their Effects on Scientific Society Meetings and Publications

"Confusion and ambiguity" plague the issues of openness in professional societies and national security. Rosemary Chalk, Program Head of the Committee on Scientific Freedom and Responsibility, American Association for the Advancement of Science (AAAS), said that their interest in these issues was sparked by a series of incidents in which the Departments of Commerce and Defense, citing violation of export control regulations, intervened at scientific meetings. In January 1982, Admiral Bobby R. Inman, then Deputy Director of the Central Intelligence Agency, told an AAAS symposium that a "hemorrhage" of sensitive scientific information was causing damage to U.S. security interests. If the scientific community itself did not take steps to restrict this flow, Inman warned, there would be a "tidal wave" of repressive legislation.

Since then, Chalk said, the role of the Committee on Scientific Freedom and Responsibility has been to document government restrictions on meetings and publications. The Committee chronicled thirteen incidents from 1980 to 1983. A

few days before its 1980 conference, the American Vacuum Society was informed by the Commerce Department that oral exchange in the U.S. with foreign nationals constituted export of technical data. The communique implied that failure to comply with export license rules would expose both the presenters and the conference organizers to fines and prison sentences of up to ten years. In response, the society rescinded invitations to scheduled attendees from Hungary, Poland, the Soviet Union, and the People's Republic of China. The State Department intervened, saying it would clear the People's Republic scientists who had arrived before receiving their visa revocation order if they would sign a nontransfer agreement stating they would not disseminate the information to any foreign nationals, including their own countrymen. On six occasions the Institute of Electrical and Electronics Engineers (IEEE) was told by government officers to withdraw papers from meetings or to reclassify articles in their publication. The Society of Photoinstrumentation had 100 papers withdrawn upon DOD orders before its 1982 conference.

DOD's development of ground rules that stop broad, arbitrary interventions has helped, but clarification is needed, Chalk said. Some societies, on their own initiative, are closing meetings to foreign participants. Many participants in professional society meetings are under government contractual obligations requiring them to withhold information from foreign nationals. Yet up to 20 percent of the membership of some professional societies are foreigners. Societies have closed conferences in the past, but only when they were cosponsored with a government agency.

The rationale that information control is necessary because an agency has generated contracts is alarming, Chalk concluded, given that 70 percent of federal research and development is sponsored by the Department of Defense. AAAS urges refinement of the distinction between science and technical know-how. Professional societies' purpose is to encourage interaction between those engaged in fundamental research and those engaged in specific application.

Legal Aspects of Information as an International Commodity

The almost exponential growth of information systems is increasingly evident to all of us. Five years ago the information field in the U.S. was the third largest industry behind petrochemicals and automotive. Last year it was number two. Within five years it promises to be the largest industry in U.S. history, noted John B. Farmakides, partner in the Washington law firm of Whitney & Dempsey.

This growth has brought with it both direct and indirect regulation by an increasing number of industrialized and developing nations. Most recently, for example, the U.S. established a comprehensive policy on the treatment of technical data through DOD procurement systems and the U.S. trade and export control law, Farmakides said.

The growth of information systems has also brought with it the need to protect the intellectual property generated so that research and development costs may be properly recovered. On a global basis, how can we protect information as a commodity within an evolving information society; what incentives are available; what precautions are necessary?

Those persons and companies that create information products, provide information services, and place capital at risk in the information arena must have incentives for their contributions and work. The current legal systems and concepts for protecting intellectual property are inadequate: patents, copyrights, trademarks, trade secrets, and contract clauses all have limitations.

For example, while patents may protect inventions and discoveries, they are relatively expensive and slow to obtain, provide a relatively short duration, and software (other than "firmware") is not patentable, he explained. Copyright protection generally extends only to the "expression or form" of the writing and not to the ideas or concepts expressed. In passing the Software Copyright Act in 1980, Congress expressly mandated that computer programs were subject to copyright protection but many owners continue to question the usefulness of such protection. So

too, while trademark protection may be valuable to reflect the source of the information, and perhaps its credibility, it does not provide protection against unauthorized use of the information itself.

Trade secrets may provide protection for technical data and information, but the need to maintain "secrecy" along with the procedures involved in meeting the requirements for trade secret protection seriously reduced the effectiveness of this legal right. Moreover it does not prevent someone from duplicating the information either through reverse engineering or by acquiring it without infringing on the trade secret relationship. (The observation made by some that a patent and a trade secret are incompatible is incorrect, he noted. Obviously, while a patent is pending its substance may be kept secret; likewise, a patent may be issued to a broad invention and later refined with trade secret improvements and know-how).

General contractual rights are another technique whereby protection may be obtained, but these, too, have obvious limitations. The export-import customs law, trade and tariff controls are also available as secondary methods for protecting information which falls within their mandate. Finally, Farmakides noted that many creators and innovators in the fast moving information arena protect their proprietary information by "... moving faster and staying ahead of the competition." This may be acceptable for a time but, invariably such a person cannot maintain the pace and must look to other methods in order to stay competitive.

He noted further what appear to be significant new developments presaging a national recognition of the need to address intellectual property rights as they relate to an information oriented society. In passing the Semi-Conductor Chip Act of 1984, for instance, the Congress established a new legal property right having great importance to the information industry. This new right appears to be broader than a copyright, perhaps amounting to an industrial property right, but limited, however, to the field of semiconductor chips. As passed by the Congress, the act is a model procedure seeking to protect intellectual property in the international sector through incentives and cooperation.

As another example, the growing controversy over the international allocation of geosynchronous orbits for communication satellites is undergoing serious domestic reconsideration as an element of the transborder flow of information. So too, the question of ownership of information obtained through remote sensing satellites, especially that information which reflects a nation's vital resources, is a topic which will receive a great deal of attention, both domestically and on an international level.

Mr. Farmakides concluded his remarks by stating that until there were more effective means available on an international scale for protecting proprietary rights in information, he would counsel the use, in combination, of as many of the currently available intellectual property rights as possible.

The Ferment in International Telecommunications

"Mr. Telecommunications in the U.S." was how Dr. Joseph F. Caponio, Director of the National Technical Information Service, introduced Henry Geller, Director of the Washington Center for Public Policy Research; and Geller proved worthy of the title. Enormous changes in technology, not government policy he said, have opened the domestic telecommunications industry to competition. Burgeoning technologies — microwave, coaxial cable, satellites, fiber optics, and the computer — require fast responses in the marketplace. Government regulations will always exist, but companies need no longer seek permission from a federal agency to introduce new products and services. The telephone line is the power line; any equipment can be put on it so long as technical standards are met. Four hundred carriers now compete with AT&T. MCI and GTE are spending a billion dollars a year on construction. In 1972 the FCC established an "open skies" policy. RCA put up satellites. To distribute its pay programming, HBO turned to satellites. Satellites efficiently offer tailored services to the cable operator and make possible urban cable, which now penetrates 42 percent of the U.S. video marketplace.

Great benefits have accrued from domestic competition. Competition is coming to the international scene where different problems exist.

AT&T, MCI, and others provide voice transmission to U.S. end users; RCA, Globcom, ITT, and others offer telex, but there are no voice record distinctions today. In Germany, France, and other European countries, the consumer must contend with government-owned systems which often want maximum profits to subsidize postal systems. These postal telegraph and telecommunications agencies (PTTs) are not interested in fostering competition.

Satellites and cable are the two modes of international communication. Seven transatlantic cables are owned 50/50 by private U.S. companies and European PTTs. A fiber cable (TAT 8) now being laid will in 1988 provide all the capacity needed for voice and picture transmission in 1990, so also will a new generation of satellites—the VI. Satellites are the most economical transmitters of voice and television to underdeveloped countries. The new smaller earth stations are easily erected in areas close to the customer. Sixty-five percent of international communications traffic travels by satellite, Geller stated.

Largely a U.S. creation, INTELSAT is the major world satellite operator, representing 109 nations in their use of space segments. Created in 1962, COMSAT owns 23 percent of INTELSAT and is its U.S. representative. Any private U.S. carrier wanting to access INTELSAT must go through COMSAT, a competitor. Five U.S. companies now seek to break INTELSAT's space monopoly. They want to erect their own earth stations, control their own space, and work out private arrangements with foreign users. The President, concerned about protecting INTELSAT's viability, nevertheless has recommended that the FCC grant the applications. Because these competing systems are limited to customized service — private lines that do not go into the international switched public network — they will be in the national interest, the President says, if they have a foreign partner and if they cause no adverse economic or technical impact on INTELSAT. Only 14 percent of INTELSAT's revenue comes from private or customized services; 86 percent derives from long distance telephone calls, mostly between the United States and Europe.

These problems raise difficult policy questions, according to Geller. INTELSAT is a success.

Through it we have achieved a "global village." If INTELSAT is undermined, third world countries may turn to INTERSPUTNICK or other rival organizations. Moreover, a fully open system will have a substantial economic effect on INTELSAT — and the United States signed an international agreement to protect that organization. Finally, the argument is made that a new system cannot be limited to customized services. Businesses receiving the transmission on private lines (dedicated circuits) also have Private Branch Exchanges (PBXs) and can be used to switch the signal anywhere.

"Domestic is prologue," Geller said. "Market segmentation did not work domestically and over time it won't work internationally." AT&T's competitors initially were thought to be authorized to use private lines which represented only 2 percent of AT&T's revenue. But the competitors sought and gained access to the switched voice segment. Thus the monopoly was broken and the field opened up. "Competition should drive competitors to marginal costs," Geller said. "But competitors enter an open field like this, fail, cry 'unfair competition,' and the government, not wanting them to go under, bails them out. Governments cannot run a large subsidized or 'skewed' system and at the same time foster competition within it. Internationally, INTELSAT will have to respond flexibly in its pricing to the new competition, and may find it difficult to continue subsidies to developing nations. In the international arena the foreign partner *is* the government. If all the cards are in the foreign PTTs' hands, American competitors will have to make revenue concessions; thus our government will have to intervene to protect our new competitors."

There are answers to these objections, Geller added. The dominant U.S. system is infecting the world with competition. Great Britain and Japan have privatized their systems and are bringing in competition. Change will spur price reductions and enable countries to work out agreements. "We must authorize competition because it is inevitable," observed Geller, "The real issue may be managing the transition. We must get rid of monopoly middlemen like COMSAT and give the user direct access. The drive must be toward letting the marketplace rule."

Geller next discussed transborder data flow. This issue involves privacy and security and is of critical importance to world commerce. Multinationals use satellites to send government and company data to the U.S. for processing. At the speed of light, data travels from Europe to Ohio, from Ohio or Maryland to Hong Kong, Sweden, France. Since the U.S. is dominant in software and data processing and holds so much foreign data within its borders, other countries want assurances that information cannot flow into computers without privacy protection. The Department of Commerce and the Business Roundtable have urged companies to abide by voluntary privacy guidelines adopted by the Organization for Economic and Cooperative Development (OECD). The Council of Europe will soon adopt a treaty stating that unprotected data cannot flow; however, privacy protection in Europe is of an omnibus nature and is administered by agencies; in the U.S. it is sector by sector, and we tend to rely on the courts.

International trade and services is another important issue. After divestiture, the U.S. is wide open and buys products and services from any country. But Japanese, West German, and Brazilian companies must meet closely held government standards and usually buy within their own borders. The U.S. Trade Representative is currently engaged in negotiations on this problem.

Answering questions from the informed forum audience, Geller said there is a limit to growth. Smaller companies will have to specialize to compete with the AT&Ts and MCIs of the world. The market is cruel. In domestic and international shakeouts competitors will fall. "The point to remember is, let them go under and don't ask governments to bail them out," Geller said. Given that the antitrust decree mandates equal access in 1986, government "subsidies" (now based on unequal access) to MCI and other competitors of AT&T should disappear in 1986. "Don't bet on it," Geller warned. "To keep them flourishing, some price 'break' will continue."

What networking options do librarians have? If libraries have the funds, Geller answered, they can ride piggyback on a satellite with another organization like public broadcasting. They can by-

pass, erect their own dedicated networks and avoid large local access charges. "A problem domestically is that we're giving off false economic signals. Access rates reflect government subsidies. Large users want to avoid those high charges, so they build their own networks. If they leave the local network, the local telephone company is stuck with stranded investment. It has lost a high volume user, but still has the costs. The answer is—drive the system to marginal costing. Then those who want to bypass will do so because it's economically sound—not because of false signals. Members of Congress don't want local rates to go up while they are running for reelection. They want competition and they want low rates with continuing subsidies. That can't be done. If you opt for competition, you gotta come clean."

International Influences on the Flow of Sci/Tech Information

Moderator Joseph G. Coyne, Manager of the Office of Scientific and Technical Information, U.S. Department of Energy, noted that the United States was credited in the 1950s and 1960s with 75 percent of the world's total research and development. Today it performs 30 percent of that total. We have been surpassed by some countries in some fields. We worry about STI outflow, but what about inflow? We must promote international information sharing. Foreign nations find it expensive to share research findings and to maintain an information system if they go it alone. The Third World is calling for industrialized nations to make technical information freely available. Bilateral and multilateral information exchange programs based on reciprocity are the economic solution.

Difficulties in International Cooperation on STI with Government-Related Organizations

As one of the world's largest computer networks giving American scientists access to European and Japanese STI data bases, and as abstracting and indexing service for all the world's chemical literature, the Chemical Abstracts Service (CAS) depends heavily on the free flow of STI across national and international boundaries. James V. Seals, Director of STN International and

International Programs, CAS, read the 1984 American Chemical Society (ACS) public policy statement on the transborder data flow issue. ACS recognizes "that the Chemical Abstract Service is an irreplaceable international resource that could not have been built without international support and the unimpeded flow of information from many nations. ACS is obligated to ensure that the content of CAS data bases remains accessible to all information users in all nations and is not exploited for purely commercial or nationalistic purposes."

Apart from commercial considerations, ACS supports the free flow of STI as an essential element of scientific endeavor and human progress. This position applies only to public information, not to military secrets or corporate proprietary information, Seals explained.

In cooperative endeavors with more than thirty foreign governmental organizations, CAS encounters these problems: (1) Information Independence—a claim rarely used in the private sector except by those who seek government financial support. This syndrome has it that since a nation's independence depends on its information, the country must develop its own "information infrastructure" and not rely on foreign sources. (2) The "national airline" or prestige syndrome. Just as every nation must have its own national airline, so it wants its own on-line STI host offering every major data base. It matters not that citizens already have access to other sources or that the market is not large enough to support a national, all-inclusive data base. (3) Disregard for economics. Foreign governments and organizations consciously choose to pay higher prices than necessary for international information services in order to conform to their own procedures or to avoid getting approval for an exception. (4) The "teenager syndrome." Here the motto is, "I know what's best for me. Don't tell me what to do, just pay my bills." But "free" money always has strings attached. Please define the strings, CAS asks suppliers and recipients of government financial support.

Seals stated that subsidized organizations expect favored treatment because "we are the government." A company's standard business practices are brushed aside because they do not

"conform to our rules." A high-level official from a major nation in a negotiating session said, "It's our place to be capricious and arbitrary, not yours." Finally, (5) Turf baffles, a problem more frequent in government-supported organizations than in the private sector. Progress is always impeded by disagreements over who is responsible for decisions. As an organization operating in the international arena, CAS's plea is for flexibility and a spirit of partnership between the public and private sector.

Acquisition and Use of Foreign Technical Information

Dr. Joseph E. Clark, Deputy Director of the National Technical Information Service, recounted how NTIS was created at the close of World War II to acquire and declassify foreign scientific and technical documents after U.S. teams brought scientists back from Germany. Today there are four major routes by which NTIS acquires information for the American public: government R&D agencies and state and local governments; government-to-government agreements—for example, NTIS has a cooperative protocol with the People's Republic of China in which scientists come to America to learn how modern information systems operate; cooperating private agencies in other countries; and in-country acquisition.

In 1984 one quarter of NTIS's 75,000 reports came from foreign sources. Many come through bilateral agreements with other nations which are managed by other agencies such as the Department of Energy's Office of Scientific and Technical Information. There is high demand for "best-sellers" both in native languages and in computer-aided English translations. One of the best sellers from Japan, for instance, is *Study of Accidents Involving Industrial Robots*. NTIS provides foreign source information in ten categories in four formats: full text in paper copy and microfiche; abstracts in the NTIS bibliographic data file; abstracts bimonthly in *Government Reports Announcements and Index;* and weekly in the *Foreign Technical Abstract Newsletter,* developed at NTIS to selectively disseminate information from foreign sources. NTIS's principal buyers are domestic business and industry, academic institu-

tions, foreign agencies and businesses, and the federal government. Coming attractions include agreements with sellers and vendors on data bases from Europe, such as all West German government-sponsored unclassified research not already going to DOE or the National Aeronautics and Space Administration; SIGLE, A European multinational data base; PASCAL, the French technical data base; and from Japan, online access to eight scientific and technical data bases held by the Japan Information Center of Science and Technology (JICST); and a compendium citing 60,000 Japanese research projects in progress similar to Federal Research in Progress (FEDRIP). To encourage greater STI flow, NTIS also plans a 1985 conference to be cohosted with JICST.

International Scientific and Technical Publishing: A Private Sector Perspective

Charles B. Stoll, Vice President of John Wiley & Sons, Inc., said that U.S. sci/tech book publishing, like NTIS, came of age with the task of assimilating and documenting declassified research from emigré German scientists. Postwar expansion enabled a small group of publishers in the 1950s and 1960s to establish worldwide networks for the dissemination of university textbooks and science and engineering books. Markets were open for the pioneering of multinational publishing. European publishing skills were absorbed into subsidiaries of American houses, and these subsidiaries began publishing local European, Japanese, and other authors for world markets. European scientific publishing reemerged. English had become the international language of science, replacing German.

These two events — the internationalizing of U.S. scientific publishing and the revival of European publishing activities — prompted a group of European and American scientific, technical, and medical (STM) publishers still active today to create a forum for worldwide approaches to publishing problems. Journal publishing emerged as an important part of American sci/tech publishing. Journals are international in scope, content, and authorship and function primarily as information sources. Many have multinational editorial boards.

Wiley publishes over 120 journals here and abroad. Its translations from English into 55 foreign languages are an important secondary activity.

The American publishing industry is providing a needed service for students, libraries, and universities throughout the world, Stroll said. Developing countries use and need more American books. U.S. publishers want to increase and strengthen bases in Third World countries, so as to gain direct access to the skills of local authors in adapting textbooks for local needs and markets.

STM publishing went through its adolescence without government subsidies, according to Stoll. Book exports from all publishers now total $800 million a year. U.S. professional and reference books account for $300 million of this total. This figure does not include the multinational activities of publishers here and abroad. U.S. publishers' total exports of periodicals amount to $450 million a year, of which roughly $100 million are sci/tech journals from commercial sources. Imports — $300 million a year for books and $50 million for periodicals — are far outweighed by exports. (These figures include no breakout of STI titles.) Inventory demand is such that U.S. publishers have trouble making products available at prices and in forms suitable to Third World nations, Stoll said.

An industry survey found that piracy, especially of sci/tech books, is the "number one problem inhibiting international trade," Stoll said. Illegal operators worldwide, seizing an opportunity for quick profits, steal and repackage copyrighted materials. Governments, too, engage in *legalized* forms of compulsory licensing or fail to monitor existing laws. In China there is wholesale copying of books and journals. Our government is beginning to recognize this problem and is using control of piracy as a *quid pro quo* for other trade agreements.

Government restraint on the flow of information is of grave concern to STI publishers. Restraints on the rights of scientists to publish, attend conferences, and export scientific publications, as well as policy uncertainties limiting free exchange of nonclassified material would inhibit the delivery of scientific and technical information, Stoll concluded.

Current Issues That Have Arisen Affecting the International Flow of Information

"Copyright law development at the national and international levels is perceived as 'slow' because the problems of the information revolution are so new," said Lewis I. Flacks, Policy Planning Adviser to the Register of Copyrights, Library of Congress. International copyright law is covered under the Universal Copyright Convention (UCC) and the Berne Convention for the Protection of Literary Articles and Works. These conventions have overlapping memberships and address important copyright questions together, seeking to develop a consensus on solutions to new problems. Flacks briefly summarized the differences in content between the Berne and the UCC treaties.

UCC makes the works of authors who are nationals of UCC states eligible for protection under national laws of other contracting states. The United States and the USSR are parties only to the UCC.

The UCC's cornerstone is the "rule of national treatment," which prohibits discrimination between the copyright protection accorded nationals and that accorded foreign authors. The basic UCC obligation is to provide "adequate and effective" copyright protection as well as certain economic rights.

The Berne Convention is more specific in rights and subject matter of protection than UCC. Though not a model law, Flacks said, Berne is "a highly self-conscious piece of international legislation" which strives for internationally harmonious copyright laws among nations. Both Berne and the UCC count among their members developing and socialist countries.

At present, copyright appears to be the preferred form of protection for computer software in thirty countries. Protection of software under industrial property systems by the World Intellectual Property Organization was examined a decade ago, but there was little interest in developing an international patent-type registry for computer software. Copyright protection for computer software creates interesting new questions, Flacks noted. What is an author? Can the same qualitative judgments of authorship be applied to ideas and to their expressions? To informational works?

To processes, formats, or procedures? How is the traditional doctrine of fair use applied? Is it applied to commercial and/or noncommercial use of protected software? How would a court looking at a piece of software within the context of an infringement case determine substantial similarity?

Another area of concern to the STI field is access to protected works through information storage and retrieval systems, Flacks said. How will the author's (copyright holder's) property rights be treated if they are input into these systems? Such theoretical problems must be decided by people in the business of creating and distributing information. Legal debates are proceeding at a much slower pace than business decision-making and library planning.

Data bases are copyrightable—both preexisting works and compilations. But data bases have been analogized to directories and the copyright in directories may be so-called "thin copyright," usually providing narrower rights with greater user privileges than those within the framework of fair use.

One issue emerging from the debate on private copying is that copyright may evolve into a rights remuneration rather than a rights control. The question becomes: who will set that remuneration?

"I think there may be a collision between the copyright holder's commercial expectations and the more traditional American tendency to provide free access to information," Flacks said. "The government is interested in restraining information that the private sector regards as a market opportunity. There is also the question of whether copyright needs to be internationalized, with a greater degree of commonality in law liability and expectations across borders. There is a point at which the subject matter of copyright increases so broadly that everybody in some sense becomes an author," Flacks continued. "Very strong economic and social pressures to lower the level of copyright protection will probably arise."